

### **REMARKS**

Claims 1-10 are pending in the application.

#### **Examiner Interview**

Applicants thank the Examiner for the opportunity to discuss the August 26, 2009 and March 25, 2010 Declarations under 37 C.F.R. § 1.131 of Inventor Wei Sun. While no agreement as to the actual date of invention was reached, Applicants respectfully submit that the enclosed third Declaration of Inventor Wei Sun establishes that the Applicants actually reduced to practice the invention before the earliest date to which Boland et al. (U.S. Pat. No. 7,051,654; hereinafter "Boland") might qualify as a prior art reference.

#### **Rejection of claims 1-10 under 35 USC § 102(e)**

Claims 1-10 remain rejected under 35 USC § 102(e) as allegedly anticipated by Boland et al. (U.S. Pat. No. 7,051,654; hereinafter "Boland"). The Examiner has now asserted that the Declarations of Inventor Wei Sun under 37 C.F.R. § 1.131 (dated August 26, 2009 and March 25, 2010) were not persuasive, presumably because they do not establish a "date of invention" of February 22, 2003, but merely establish that the Applicants provided a drawing of a multi-nozzle printer to Mironov as of February 22, 2003. The Examiner has requested clarification, particularly as to whether the Applicants are alleging actual or constructive reduction to practice, and if actual reduction, whether it occurred prior to or subsequent to the effective date of the reference. The Examiner further asserts that the claimed invention is directed to more than "just a multi-nozzle printer".

Applicants respectfully submit that Boland does not anticipate claims 1-10 of invention for the following reasons. 35 U.S.C. § 102(e) provides that an applicant shall be entitled to a patent unless "the invention was described in ... a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent ...." Boland does not satisfy this requirement.

In view of the enclosed Declaration of Inventor Wei Sun under 37 C.F.R. § 1.131 (executed November 10, 2010), Boland does not anticipate claims 1-10, because the Applicants

actually reduced to practice the invention prior to February 22, 2003, which is before the earliest date to which Boland might qualify as a prior art reference.

The present application, U.S. App. Ser. No. 10/540,968, is a national stage entry application of PCT/US04/15316, filed May 14, 2004, which claims priority from U.S. Provisional App. No. 60/520,272, filed November 14, 2003. Boland was filed on September 17, 2003, published on December 2, 2004, issued as a patent on May 5, 2006, and claims priority to U.S. Provisional App. No. 60/747,469 which was filed on May 30, 2003.

Boland is not a proper 35 U.S.C. §102(e) reference because Applicants of the present application invented and reduced to practice the apparatus, as well as the processes the apparatus performs, before Boland, as evidenced by the apparatus and the processes performed as described and depicted in Exhibits A and B, prior to February 22, 2003, which is earlier than the earliest date that Boland could conceivably qualify as a prior art reference.

The unpublished manuscript of Exhibit A describes the process for construction of heterogeneous CAD modeling based composite unit cells. As explained in the unpublished manuscript of Exhibit A, the constructed unit cell is a multi-volume based CAD model with material heterogeneity assigned as a design attribute in the volume. Modified Boolean operation with reasoning merging and extracting is developed to execute the object manipulation between different materials (volumes). The heterogeneous unit cell model is capable of capturing the designed geometrical configuration and reinforcement orientation at the individual constituent phases, as well as retaining the distinctive reinforcement and matrix material properties. In addition, the developed unit cell model is also intended for implementation with available CAD/CAE/CAM systems for integrated design, simulation, and manufacturing of advanced composites. The unpublished depictions of Exhibit B illustrate various designs of a multi-nozzle biopolymer deposition apparatus for implementing the processes described in the unpublished manuscript of Exhibit A. The depicted apparatus of Exhibit B is a multi-nozzle printer designed to process the desired scaffold model and convert it into a layered process tool path, as well as to simultaneously deposit materials to construct the scaffold.

Even assuming, *arguendo*, that the filing date of U.S. Provisional App. No. 60/747,469 is available as the critical date of the '654 patent under §102(e), that filing date occurs after February 22, 2003 and thus the '654 patent cannot anticipate the claims of the present application under §102(e).

In light of the present arguments, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-10 under 35 U.S.C. § 102(e).

**Summary**

Applicants respectfully submit that the arguments set forth herein evidence that the pending claims are in full condition for allowance. Accordingly, favorable examination of the claims is respectfully requested at the earliest possible time.

Respectfully submitted,

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